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Utilization of edible and medicinal plants by tribal People's of Kondagaon district of Chhattisgarh

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Abstract

The Chhattisgarh state in central India is surrounded by rich forest resources and known for its biological diversity of edible and medicinal plants that tribal communities have utilized for ages. The present investigation was carried out during year 2020-21. The tribes living in Kondagaon district, like the Gondi, Maria and Baiga, employ a large number of plant species for traditional healthcare, food and nutrition. A study was documented the plants used by women and children for healthcare according to local tribal knowledge. Through field visits recorded information on 66 plant species across 64 genera and 37 families of different habits of tree, Shrubs, herbs, and climbers. The 28 species with the highest usage frequencies like *Madhuca indica* and *Bambusa vulgaris*, were further documented. This study plays an important role in further researching the alkaloids and compounds responsible for treating chronic diseases. There is an urgent need to preserve such valuable traditional knowledge and practices for future generations' healthcare, nutrition, food security and indigenous plant conservation.

Keywords: Tribes, traditional knowledge, medicinal plant, edible plant

1. Introduction

Indigenous communities around the world have accumulated extensive traditional ecological knowledge about the use of local plants for food, medicine and other purposes over many generations (Sánchez-Castro *et al.*, 2019) [12]. In India, tribal populations inhabit forests and depend on biodiversity for their primary health care needs and food security (Panda *et al.*, 2020) [7]. The state of Chhattisgarh is home to a number of tribal groups that have inherited profound knowledge of plant-based remedies and continue practicing traditional medicine (Nandi *et al.*, 2018) [5].

Kondagaon district of Chhattisgarh is located in a biodiversity-rich region inhabited by communities like the Gondi, Baiga and Maria tribes. These tribes have a long history of utilizing forest plant resources sustainably (Chandrashekara and Sankar, 2020) [3]. Previous studies have documented the ethnomedicinal uses of certain plants in Kondagaon (Sahu *et al.*, 2014) [10]. However, comprehensive documentation of the diverse plant species used traditionally as food and medicine by local tribes, especially in relation to women's and children's health, is still lacking.

Such ethnobotanical knowledge plays a crucial role in primary healthcare, nutrition security as well as biodiversity conservation (Shekhawat and B salvation, 2016) [11]. With ongoing cultural and environmental changes, much of this invaluable indigenous knowledge is at risk of being lost (Arya *et al.*, 2017) [1]. Therefore, the present study aimed to conduct an ethnobotanical survey and document in detail the edible and medicinal plant resources utilized traditionally by tribal communities in Kondagaon district of Chhattisgarh. The findings could help inform conservation of biological resources and revival of plant-based traditional medical practices.

2. Materials and Methods

The experimental was conducted at Kondagaon district in three blocks *i.e.*, Keshkal block, which consist at, Siganpur, Batrali, Bandhpara, Villages and Pharasgaon block Gatipalna, Chichadi, Manjhiattgaon, Villages and Baderajpur block Kalgaon, Tewsra, Kongera, villages of the district to cover the maximum Out of total number of household of tribal families in each selected blocks and villages, a representative sample of twenty percent was selected randomly for the study.

The tribal respondents and the tribal medicines men which were incorporated in this studies for collection of data and required information. The important edible and medicinal plants

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occurs during three season (Rainy, Winter and Summer) was collected identified and recorded from the selected study area with the help of forest department and local herbal healers and local resident tribes.

Ethnographic data on the edible and medicinal plants used by local tribal women and herbal healers was collected through structured interviews and questionnaires. Information on the traditional uses of each plant species by different tribal communities and healers in the study area was recorded systematically using pre-designed forms and protocols. Semi-structured interviews were conducted with tribal women and herbal practitioners to understand the medicinal uses, drug preparation methods, dosages and administration procedures. The recipes of traditional remedies and healthcare foods were carefully documented directly from knowledge holders. At the end of each interview, plant specimens were collected, properly pressed and dried to be incorporated in the herbarium collection. Samples of indigenous foods were also obtained from tribal women to cross-validate the preparation recipes gathered through discussions. Overall, a rigorous ethnomedicinal data collection approach was followed to capture valuable traditional plant-related healthcare knowledge from local communities.

3. Results and Discussion

An ethnobotanical survey was conducted in the forested villages of selected blocks in Kondagaon district to document edible and medicinal plant species. Information on traditional uses was gathered from local tribal communities using questionnaires during field visits. Concurrently, plant specimens were collected, identified and photographed. As shown in Table No. 1, a total of 66 plant/animal species were documented based on information received from local tribes residing near forest areas. The plants were collected, identified and documented during field survey/tours of potential habitat sites in consultation with community members.

Total of 66 plants belonged to different genera and families. It was found that these plants/animal were highly utilized by different ethnic groups residing in the study area which was collected by the nearby forest area. The distribution of these edible and medicinal plant/animal species in study area was mostly common but some of the plants were also found rare and comes under threatened and endangered categories. The observation on medicinal and edible plants had been recorded as per the information received from Gondi, Halba, Muria, Maria, Baiga and Kamar tribes residing in the study area. During the investigation it was found that the tribal medicine men called as Gondi and old tribal people in the study area possess a highly considerable knowledge of the therapeutic properties of these medicinal plants / animals. The information regarding the edible and medicinal properties of the enlisted plant i.e., *Adhathoda vesica*, *Cassia tora*, *Abutilon indicum*, *Celastrus paniculata*, *Azadirachta indica*, *Aegle marmelos*, *Andrographis paniculata*, *Buchnania lanzan*, *Asparagus racemosus* etc., given by the tribal people was properly recorded and was further analyzed for

conclusion.

Among life forms, Herbs (28 species) constituted the dominant growth habit utilized followed by Trees (21 species), as reported elsewhere (Shekhawat *et al.*, 2017) [13]. Leaves emerged as the most frequently used plant part similar to utilization trends across tribes in India (Pandey *et al.*, 2016) [8]. The communities exhibited rich ethnobotanical wisdom in diverse uses of documented plants as nutritive foods, herbal remedies and other applications (Shrestha and Dhillon, 2016) [14].

The edible and medicinal plants /animal belongs to different habit i.e. tree, shrub, herb, climber, grass, insect, fungus. Among these habits as shown in Table No. 2 and Fig 1, 2, 3 and 4. Herb attains the maximum of 28 plants species followed by Tree (21), Climber (7), Shrub (6), Fungus (2), Grass and insect (1) each. The tribal communities showed a rich knowledge about the utilization of the different plants and also frequently used for consumption and in preparation of different formulations as herbal medicines from long back generations to generations.

The present study documented 66 edible and medicinal plant species belonging to various genera and families that were traditionally utilized by ethnic communities inhabiting the study area. Similar ethnobotanical studies from Chhattisgarh have reported a wide diversity of plants used locally for food and healthcare (Sahu *et al.*, 2014; Chandrashekara and Sankar, 2020) [10, 3]. Some of the documented species in the present study like *Adhathoda vesica*, *Cassia tora*, *Abutilon indicum* are also cited in other ethnomedicinal studies from the region (Narayanan *et al.*, 2018) [6].

It was observed that these plant resources were mostly gathered from surrounding forest areas and their distribution was predominantly common across the landscape. However, a few threatened and endangered species like *Celastrus paniculata* were also reported (Joshi and Joshi, 2018). The tribal medicine practitioners like Gondis had particularly profound knowledge about therapeutic properties of local flora, maintaining health traditions across generations (Raut *et al.*, 2017) [9]. Similar results were also observed by Sharma and Hazarika (2018) [15] reported 40 ailments which were being treated by total 76 traditional medicinal plants found in the area, in which 23 herbs were found the dominant habit used for preparation of traditional remedies followed by 24 tree, 22, shrubs and 3 climbers. Leaves were also found to be the most frequently used plant parts followed by roots for preparation of herbal drugs.

The findings of the study highlight the need to expand our knowledge of wild edible plants that can enrich nutrition and food diversity. However, many such species face increasing threats to their survival due to lack of awareness and conservation efforts. Both biological resources as well as associated traditional knowledge need urgent safeguards. Therefore both wild edible plants as well traditional knowledge need priority action for conservation. Thus, the above finding were in conformation with the medicinal properties of plants as documented in these investigation.

Table 1: Documentation of flora and fauna Kondagaon District

S.N.	Scientific Name	Local Name	Family	Habit
1.	<i>Amorphophallus paeoniifolius</i> (Dennst.) Nicolson	Jimikand	Arecaeae	Herb
2.	<i>Anacardium occidentale</i> (Linn)	Kaju	Anacardiaceae	Tree
3.	<i>Andrographis paniculata</i> (Burm. f.) Nees	Bhuineem	Acanthaceae	Herb
4.	<i>Annona squamosa</i> (L.)	Sitafal	Annonaceae	Tree

5.	<i>Argemone maxicana</i> (Linn)	Satyanasi	Papaveraceae	Herb
6.	<i>Asparagus racemosus</i> (Willd)	Satavar	Asparagaceae	Climber
7.	<i>Astraeus hygrometricus</i> (L.)	Boda	Tuberaceae	Fungus
8.	<i>Bambusa vulgaris</i> (L.)	Basta (Karil)	Poaceae	Grass
9.	<i>Bauhinia variegata</i> (L.)	Kachnar/Koliyari	Fabaceae	Tree
10.	<i>Benincasa hispida</i> (Thunb.)	Rakhiya	Cucurbitaceae	Climber
11.	<i>Boerhavia diffusa</i> (L.)	Punarnava	Nyctaginaceae	Herb
12.	<i>Bryophyllum pinnatum</i> (Lam.) Oken	Pattharchata	Crassulaceae	Herb
13.	<i>Buchanania lanzan</i> (Spreng)	Char	Anacardiaceae	Tree
14.	<i>Butea monosperma</i> (Lamk) Taub.	Palas	Fabaceae	Tree
15.	<i>Calotropis gigantea</i> (L.) W.T. Aiton	Aak	Asclepiadaceae	Shrub
16.	<i>Caryota urens</i> (L.)	Salfi	Arecaceae	Tree
17.	<i>Cassia tora</i> (Linn.)	Charota	Fabaceae	Herb
18.	<i>Cissus quadrangularis</i> (L.) Wall	Hadjod	Vitaceae	Climber
19.	<i>Coccinia indica</i> (W. & A.)	Kundaru	Cucurbitaceae	Climber
20.	<i>Colocasia esculenta</i> (L.)	Arbi	Areceae	Herb
21.	<i>Convolvulus prostrates</i> (L.)	Sankhpuspi	Convolvulus	Herb
22.	<i>Corchorus olitorius</i> (L.)	Chechbhaji	Malvaceae	Herb
23.	<i>Costus speciosus</i> (J. Koenig) stu.	Keukand	Costaceae	Herb
24.	<i>Crinum latifolium</i> (L.)	Sudarshan	Amaryllidaceae	Herb
25.	<i>Curculigo orchioides</i> (Gaerth)	Kalimusli	Hypoxidaceae	Herb
26.	<i>Curcuma angustifolia</i> (Roxb)	Tikhur	Zingiberaceae	Herb
27.	<i>Curcuma longa</i> (L.)	Haldi	Zingiberaceae	Herb
28.	<i>Dioscorta alata</i> (L.)	Kachal	Dioscoreaceae	Climber
29.	<i>Diospyros melanoxlon</i> (Roxb.)	Tendu	Ebenaceae	Tree
30.	<i>Eleusine corcona</i> (L.)	Pej (Ragi)	Poaceae	Herb
31.	<i>Emblica officinalis</i> (Gaerth)	Anola	Phyllanthaceae	Tree
32.	<i>Eucalyptus</i>	Nilgiri	Myrtaceae	Tree
33.	<i>Gymnemasylvestre</i> (Retz.)	Gudmar	Apocynaceae	Climber
34.	<i>Hemidesmus indicus</i> (L.) R. Br.	Anantmool	Apocynaceae	Shrub
35.	<i>Hibiscus sabdariffa</i> (L.)	Khatta bhaji (Amari bhaji)	Malvaceae	Herb
36.	<i>Justicia adhatoda</i> (Linn)	Adusa	Acanthaceae	Shrub
37.	<i>Macrotyloma uniflorum</i> (L.)	Kulthi	Fabaceae	Herb
38.	<i>Maduca indica</i> (Roxb.)	Mahua	Sapotaceae	Tree
39.	<i>Mangifera indica</i> (L.)	Aam	Anacardiaceae	Tree
40.	<i>Mimosa pudica</i> (Linn)	Lajwanti	Fabaceae	Herb
41.	<i>Moringa oleifera</i> (L.)	Munga	Moringaceae	Tree
42.	<i>Murraya koenigii</i> (L.) Spreng	Meetha neem	Apocynaceae	Shrub
43.	<i>Ocimum sanctum</i> (Linn)	Tulsi	Lamiaceae	Herb
44.	<i>Oecophylla smaragdina</i>	Chapada	Formicidae	Insect
45.	<i>Paspalum scrobiculatum</i> (L.)	Kodo	Poaceae	Herb
46.	<i>Phoenix acaulis</i> (Roxb.)	Chind	Arecaceae	Tree
47.	<i>Phyllanthus niruri</i> (L.) Lour	Bhuibhelwa/B Huiamla	Phyllanthaceae	Herb
48.	<i>Piper nigrum</i> (Linn)	Kalimirch	Piperaceae	Climber
49.	<i>Pisidium guajava</i> (L.)	Amrud	Myrtaceae	Tree
50.	<i>Pongamia pinnata</i> (L.)	Karanj	Fabaceae	Tree
51.	<i>Rauwolfia serpentina</i> (L.) Benth. ex kurz	Sarfgandha	Apocynaceae	Herb
52.	<i>Schleichera oleosa</i> (Lour.) Oken	Kusum	Sapindaceae	Tree
53.	<i>Sesamum indicum</i>	Kala Til	Pedaliaceae	Herb
54.	<i>Shorea robusta</i> (A.W. Roth)	Sal/Sarai	Dipterocarpaceae	Tree
55.	<i>Sphaeranthus indicus</i> (L.)	Gorkhmundi	Asteraceae	Herb
56.	<i>Syzygium cumini</i> (L.) Skeels.	Jamun	Myrtaceae	Tree
57.	<i>Tamarindis indica</i> (L.)	Imli	Fabaceae	Tree
58.	<i>Tephrosia purpurea</i> (L.) Pers.	Sarpunkha	Fabaceae	Herb
59.	<i>Terminalia arjuna</i> (Roxb.)	Arjun	Combretaceae	Tree
60.	<i>Terminalia chebula</i> (Retz)	Harra	Combretaceae	Tree
61.	<i>Vigna Mungo</i> (L.)	Urd dal	Fabaceae	Herb
62.	<i>Vitex negundo</i> (Linn)	Nirgundi	Lamiaceae	Shrub
63.	<i>Volvariella volvacea</i> (Bull.)	Puttu	Pluteaceae	Fungus
64.	<i>Withania somnifera</i> (L.)	Ashwagandha	Solanaceae	Herb
65.	<i>Wrightia antidysentrica</i> (L.) R. Br.	Kutaj	Apocynaceae	Shrub
66.	<i>Zingiber officinale</i> (L.)	Adark	Zingiberaceae	Herb

Table 2: Documentation on the utilization of edible and medicinal plants by the tribal communities in Kondagaon district

S.N.	Scientific name	Local Name	Family	Utilization	Frequency
1.	<i>Amorphophallus Campanulatus</i>	Zimikand	Araceae	Edible/medicinal	2
2	<i>Anacardium Occidentale</i>	Kaju	Anacardiaceae	Edible	1
3	<i>Annona suamosa</i>	Sitafal	Annonaceae	Edible/Medicinal	1
4	<i>Bambusa vulgaris</i>	Bamboo	Poaceae	Edible/Bridges/Furniture use/musical instruments/Engineered products/Bamboo basket/others	7
5	<i>Bauhinia purpurea</i>	Kachnar/K oliyari	Fabaceae	Medicinal/edible/Fire wood	3
6	<i>Buchanania lanzan</i>	Char	Anacardiaceae	Medicinal use/Fire wood / Construction use/Making pudding/Others	5
7	<i>Butea monosperma</i>	Palas./pharsa	Fabaceae	Medicinal use/ firewood/ construction use/others	4
8	<i>Caryota urens</i>	Salfi	Arecaceae	Medicinal use/Drinkpurpose/Natural beauty/Cultural festival/Others	5
9	<i>Colocasia esculenta</i>	Arbi/Kochai	Araceae	Edible/ Medicinal	2
10	<i>Curcuma longa</i>	Haldi	Zingiberaceae	Medicinal use/ edible/ Marriage function/	3
11	<i>Dalbergia sisoo</i>	Sisam	Fabaceae	Furniture use/ construction use/ firewood/Cricket bat/Others	5
12	<i>Diospyros Melanoxylon</i>	Tendu	Ebenaceae	Edible /medicinal/ Bedi/others	4
13	<i>Eucalyptus</i>	Nilgiri	Myrtaceae	Medicinal use/construction use/spices/others	4
14	<i>Maduca indica</i>	Mahua	Sapotaceae	Edible/Medicinal/ cultural festival/home purpose/drink/Marriage use/others	7
15	<i>Mangifera indica</i>	Aam	Anacardiaceae	Pickle/furniture/Edible/Medicinal use	4
16	<i>Moringa oleifera</i>	Munga	Moringaceae	Edible/medicinal	2
17	<i>Ocimum sanctum</i>	Tulsi	Lamiaceae	Medicinal use	1
18	<i>Phonix acaulis</i>	Chind	Arecaceae	Edible/Broom/boundary use /home	6
19	<i>Phyllanthus emblica</i>	Anola	Phyllanthaceae	Edible/ pickle/medicinal	3
20	<i>Pisidium guajava</i>	Aamrud/Bi hi	Myrtaceae	Edible/Medicinal	2
21	<i>Pongamia pinnata</i>	Karanj	Fabaceae	Medicinal use/Firewood/oil purpose/	3
22	<i>Schleichera oleosa</i>	Kusum	Sapindaceae	Edible/medicinal/Lack and gum use/ others	4
23	<i>Shorea robusta</i>	Sal/sarai	Dipterocarpaceae	Edible/Medicinal/Dona pattal/furniture/other construction/ Firewood	6
24	<i>Syzygium cumini</i>	Jamun	Myrtaceae	Edible/Construction use/medicinal/festival& cultural	5
25	<i>Tamarindis indica</i>	Imli	Fabaceae	Edible/medicinal/ Firewood/pickle/others	5
26	<i>Tectona grandis</i>	Sagon	Lamiaceae	Fire wood/ furniture use/building contraction.	3
27	<i>Terminalia chebula</i>	Harra,hirla , karka	Combretaceae	Medicinal use/firewood/furniture/constructionUse	4
28	<i>Zingiber officinale</i>	Adrak	Zingiberaceae	Medicinal use/ Edible	2

**Fig 1:** A view of traditional local food of the study area



Fig 2: A view of different species local people traditional food of study area



Fig 3: A view of traditional local Edible fruits of the study area



Fig 4: A view of traditional local Edible fruits of the study area



Fig 5: A view of traditional local Edible Fruits of the study area

4. Conclusion

In conclusion, this ethnobotanical survey documented a rich diversity of 66 edible and medicinal plant species used traditionally by tribal communities in the forested villages of Kondagaon district. The medicinal uses of these plants provided insights into the tribe's traditional healthcare practices and treatment of common ailments. Many plants and plant parts were still regularly collected from nearby forests and consumed as food supplements. The tribes exhibited extensive knowledge of the therapeutic properties and preparation techniques that had been passed down for generations. While most species were commonly found, some threatened and endangered plants were also recorded,

highlighting the importance of conservation efforts. Overall, the study revealed the deep connections between tribal cultures and the surrounding forests as a source of sustenance and health. Protecting these indigenous plant resources and traditional ecological knowledge would help ensure the continued well-being of local communities.

5. Research conflict

The study's reliance on local tribal knowledge may introduce biases and subjective interpretation, potentially affecting plant identification and usage accuracy. Factors like changing ecosystems and socio-economic shifts could influence traditional practices. Self-reported data might raise concerns about comprehensiveness and authenticity.

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